Applied Catalysis B: Environmental 125 (2012) 567–568

Contents lists available at SciVerse ScienceDirect

Applied Catalysis B: Environmental

journal homepage: www.elsevier.com/locate/apcatb

Corrigendum

Corrigendum to "Glycerol oxidation with gold supported on carbon xerogels: Tuning selectivities by varying mesopore sizes" [Appl. Catal. B: Environ. 115–116 (2012) 1–6]

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The authors have noticed some inconsistencies related to the identification of one of the reaction products by HPLC. The authors would like to apologise for any inconvenience caused. Therefore, the following corrections should be considered:

In the above mentioned paper, recently published in *Applied Catalysis B: Environmental* [1], we prepared gold catalysts supported on carbon xerogels with different textural properties, and their efficiencies in the glycerol oxidation were evaluated under basic conditions. According to this paper, the distribution of the main products (dihydroxyacetone and glyceric acid) would depend on the average mesopore sizes of the support.

The quantitative analysis of the mixture was carried out by high performance liquid chromatography (HLPC) and the compounds were identified by comparison with standard samples. Reactant and products were separated with an ion exclusion column (Alltech OA 1000), which is commonly used in this type of work [2–4].

Dihydroxyacetone (DIHA) is a reaction product mentioned in the literature by different groups even under basic conditions [4–8]. Under our experimental conditions, the retention time of this compound coincided exactly with one of the peaks obtained from the HPLC analysis of the reaction mixture. Therefore, in the chromatogram, this peak was identified as DIHA.

Unfortunately, we found recentely that formic acid (FORMA) was erroneously identified as dihydroxyacetone at the time the article was published. This was due to the fact that both compounds have the same retention time in the column mentioned above. Some tests were carried out using another column (BIO-RAD Aminex HPX-87H) where partial separation of standard samples of formic acid and dihydroxyacetone was achieved. The analysis of the reaction mixtures in this column allowed us to conclude that the product initially identified as dihydroxyacetone was in fact formic acid. This latter compound is not widely mentioned as a product of glycerol oxidation, especially when conventional carbon materials are used as support. However, an exception was reported recently by Prati et al. [9] when testing gold supported on carbon nanofibers, which lead to selectivities to FORMA as high as 30%.

The origin of formic acid is still under discussion. This compound is probably obtained via the base catalyzed degradation of dihydroxyacetone [10]. Therefore, it is likely that supports leading to a higher selectivity to FORMA are those that promote the initial formation of DIHA, which may require the binding of glycerol molecule in a conformation that needs more space, and therefore is favored by supports with large pores, as mentioned in the article [1]. Accordingly, we suggest that glycerol can be initially oxidized to DIHA; this compound acts as an intermediate prone to degradation due to the highly basic medium used, and a fraction could be readily converted into FORMA, whereas the remaining is further oxidized, via glyceraldehyde.Consequently, some of the results presented in [1] must be modified. Table 1

Table 1
Influence of the textural properties of the support on the activities and selectivities to glyceric acid (GLYCEA), glycolic acid (GLYCOA), tartronic acid (TARTA) and formic acid for the Au/CX catalysts.[a]

Catalyst	t = 120 min		X_{GLY} = 50%			
	X_{GLY} (%)	TOF × 10^{-3} (h^{-1})	S_{GLYCEA} (%)	S_{GLYCOA} (%)	S_{TARTA} (%)	S_{FORMA} (%)
Au/5CX	62	2.4 ± 0.9	67	22	6	5
Au/20CX	37	1.7 ± 0.9	63	23	3	11

[a] This table corrects Table 3 of reference [1].

DOI of original article: http://dx.doi.org/10.1016/j.apcatb.2011.12.008.
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http://dx.doi.org/10.1016/j.apcatb.2012.07.026

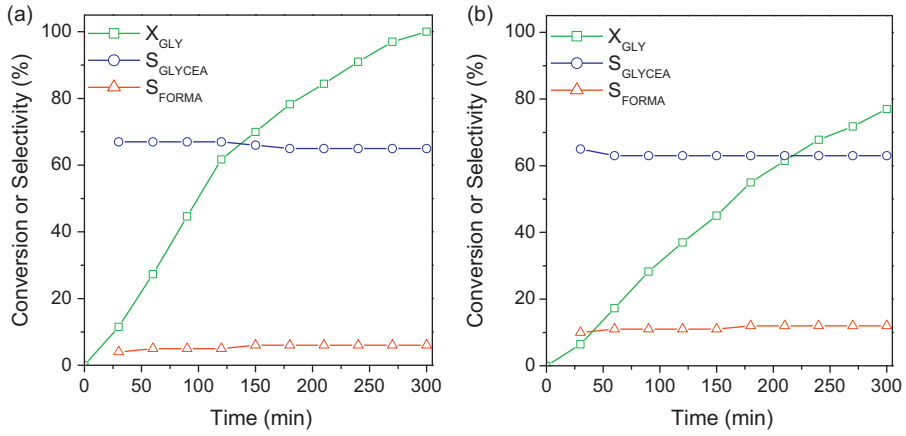


Fig. 1. Conversion of glycerol (X_{GLY}) and selectivities to GLYCEA and FORMA as a function of time using a) Au/5CX and b) Au/20CX in glycerol oxidation. Reaction conditions: 60 °C, $p_{O_2} = 3$ bar, 150 mL of glycerol 0.3 M, catalyst amount = 700 mg, NaOH/glycerol = 2 mol/mol. This figure corrects Fig. 3 of reference [1].

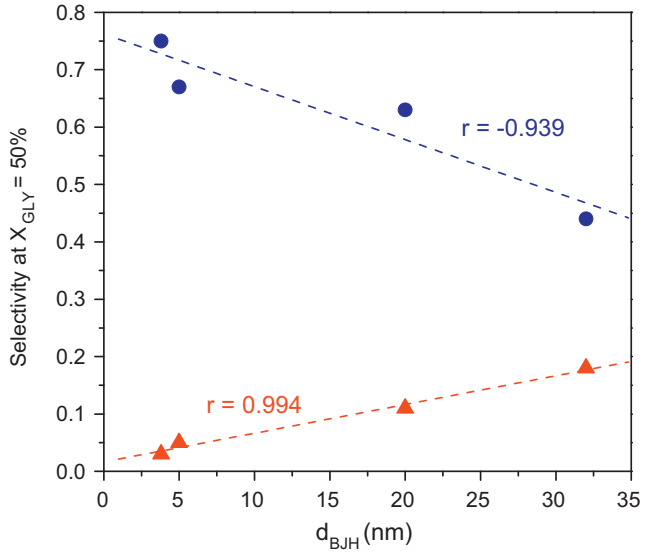


Fig. 2. Correlations between selectivities to FORMA (▲) and GLYCEA (●) and the most frequent mesopore size of carbon supports (calculated by the BJH method). Reaction conditions: 60 °C, $p_{O_2} = 3$ bar, 150 mL of glycerol 0.3 M, catalyst amount = 700 mg, NaOH/glycerol = 2 mol/mol. This figure corrects Fig. 4 of reference [1].

and Figs. 1 and 2 summarize the most relevant changes.The important generalization of the work relative to the decisive role played by mesopore sizes of carbon supports on the distribution of products is still valid. However, we may now conclude that narrow pores lead to the enhancement of the selectivity to glyceric acid, whereas wide mesopores favor the formation of formic acid, probably via dihydroxyacetone.

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